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Edited by JOHN BARTLETT.

MINNEAPOLIS CONVENTION.

IN a collection of the accidental productions of a year, where everything or anything is admitted, there must of necessity be not only a good deal which is indifferent, but also much which is positively bad. Where the chief aim is to cover as extended a wall space as possible, there is not much scope left to the hanging committee for the exercise of judgment.

Our amateur societies are wiser than our convention managers in regulating the admissions to exhibitions. The reservation of the right to reject any application not up to the standard of excellence may, and often does, cause unpleasant relations between committee and exhibitors; but the exhibition is bettered by the exercise of this discriminating power, and the cause of art furthered.

If we are to regard our annual exhibitions as means for educating the photographer, by giving a record of the progress during the year, they fail dismally if no discrimination is used, if merely a display is made of whatever is sent in.

The inexperienced photographer cannot dwell long upon such a collection as that displayed at Minneapolis without positive injury. He is apt to thank Heaven that he can do better work than much he sees, to rest satisfied with himself, and to be contented with his position of respectable mediocrity, if he does not actually degenerate.

It is urged that the immature in our profession should receive encouragement by the display of their work, however bad. Well, yes; they should be so encouraged, if the only aim or purpose of our conventions is the nurture and admonition of the weaklings. But why not have higher aims for our annual gatherings? remembering that the law of the "survival of the fittest" applies to the profession, as well as to any other phase of social life.

If we hope to make progress, we cannot afford to have so much of the milk of human kindness as would lead us to degrade our standard to the level of some men's disadvantages of environment.

There is always a goodly display of this brotherly-love sentiment coming up to the surface at our conventions, championed by some Sir Oracle; schemes for mutual benefit; projects for the protection of those who do not know how to protect themselves; grand philanthropic endeavors, big with the spirit of fraternal affection for a class of men quite as able to take care of their own interests as in any other profession: and we think they are not slow to manifest their disapprobation of the low estimate in which they are held, by ignoring the chimerical projects so persistently brought forward.

When scientists or engineers or doctors assemble at their annual meetings, they know how to enjoy themselves as well as photographers; but they do not forget the weightier purpose which has called them together from all parts of the country. They do not spend the session in devising plans for protection of their widows and orphans, or for improving their business relations, leaving the papers and discussions to come in for a constrained hearing at the fag end of the meetings, or to receive the cold courtesy of being read by title only.

We acknowledge there were some few examples of most excellent work in portraiture and landscape photography; but there was a notable falling off in the representation of the work of those who should contribute, if any just estimate of the progress of the art is to be gleaned from our exhibitions. It is mere speculation to reason as to the cause of the declination of those whose names were once prominent in our conventions—at least the falling away cannot be laid to remoteness of location, or exorbitance of dues and fees.

A greater exercise of executive power by the administration might keep together the elements which seem so liable to rupture. If the management were less good-natured and not so easily influenced by those whose only aim is self-aggrandizement, the old-time enthusiasm for conventions might revive. Interest is surely at a low ebb when recourse must be had to boom up the attendance by the offer of a chance in a lottery prize!

THE STOCK DEALERS' AND MANUFACTURERS' EXHIBITION AT THE CONVENTION.

USUALLY, when the quality of the art exhibit at our convention falls below the high water mark, one takes comfort in the assurance that the stock dealer and manufacturer will keep up the interest by their fine displays, but this year we were grievously disappointed. It needed only a very narrow angle lens to take in the whole number of firms represented.

The Scovill and the Anthony exhibits, hitherto with centres everywhere and circumferences nowhere

"Showed scarce so gross as beetles."

Amidst this dimmed galaxy, however, the display of the A. M. Collins Mfg. Co., of Philadelphia, shone like

"A bright particular star."

This enterprising company never fails in getting up something novel and beautiful to delight the æsthetic feeling of the photographer.

This year, as if to repay for the backwardness of others, they even outdid their former fine exhibits.

The amount of skill, good taste and ingenuity shown in the arrangement of cards of every hue and shape made it a positive delight to dwell beneath their broad canopy—to say nothing of the reward with which the visit was repaid by the beautiful souvenir prepared with so much taste.

The exhibit was in charge of Mr. Hastings and Mr. Janes, and we were delighted to learn that the "architecture," as Mr. Hastings called it, was the work of our old friend, Mr. Janes.

Next to the Collins exhibit was that of the Eastman Dry Plate Co., which also deserves much praise. Here, too, the visitor was treated to a beautiful souvenir in the shape of a transferotype upon a porcelain plaque.

We have frequently commented upon the beauty of this new form of photograph. An increased brilliancy is given to the print, and all the good qualities greatly enhanced by the white background. Much attention was attracted by the new detective camera—the Kodak—which makes it possible to carry in very small compass material for 100 negatives.

Zimmerman & Bro., of St. Paul, it seems to us, might have made a better and larger show, considering the short distance of their establishment from the convention grounds. Perhaps they were modest about widening their phylacteries.

H. A. Hyatt, of St. Louis, attracted about his exhibit what might, we suppose, under the circumstances be called a crowd, to see the apparatus for making stamp portraits.

G. Cramer showed a good collection of excellent work made upon his famous plate.

The Acme Burnisher Co., Syracuse, N. Y., made a fine display of their most excellent flue heating burnishers. The beautiful finish of these instruments of polish contributed much to the attraction, and the demonstration of the economy of fuel, the rapidity with which the work is done, and the perfection of the results obtained, added much to their popularity.

Benjamin French & Co., of Boston, were of course present with their fine collection of Euryscopes, and W. H. Walmsley had a booth with the Eastman Co. to display his celebrated Beck lens.

C. H. Codman & Co. were represented by Mr. Roby with the orthopanactinic lens.

The magnesium light flashed from several corners of the building.

Mr. Rockwood, at Eastman's, showed the apparatus for igniting a mixture of gun cotton and magnesium. Mr. Overpeek, of Hamilton, Ohio, had a neat piece of apparatus for discharging Blitz-pulver. Opposite his place was a fine display of work made at night with McCollin & Co.'s Blitz-pulver. The pictures attracted a great deal of attention, and visitors could scarcely believe that the superb work was the product of an instantaneous flash. The high lights were remarkably soft and pleasing, and the shadows luminous.

Mr. T. H. McCollin was himself present, and demonstrated his ingenious ignitor for setting off the charges of powder. The brilliancy, great rapidity and spontaneous action of the flash always drew a wondering crowd about him. The exhibit of permanent bromide enlargements for crayon work showed admirably the fine effects possible by the process.

Messrs. Brown and Goldsmith showed three different sizes of their patent preserving cans for silvered paper. The preservative, with the ingenious can, has come to be an indispensable requisite for every enterprising photographer.

The firm of J. A. Knorr, of New York, was ably represented by Mr. Geo. Bates, of Philadelphia, who was indefatigable in his exertions to prove the merits of the novelties he exhibited.

THE CAMERA AND THE PENCIL.

THE spirit which animates modern art would find its most appropriate symbol in the photographic camera, since realism is not only dominant in painting, but is also the controlling principle in fiction and poetry.

We have come to look at nature face to face, no longer through a glass darkly; finding in the commonest object, in the humblest character, thoughts rich in beauty, strong in truth, and of high moral purpose. Without "o'erstepping the modesty of nature," we create new scenes, call forth unexpected manifestations, and discover likenesses and difference in things which delight the imagination or touch the heart. Shakespeare tells us his mistress' eyes were "nothing like the sun," and Richardson acknowledged that Clarissa's neck was "not so white as the lace upon it, whatever poets might say if they had been called upon to describe it."

Artists may cast reproach upon photography for its literal rendering of facts, for the line for line translation of a scene in nature, but in their heart of hearts they take the greatest delight in these actual transcripts. Some years ago, painters were very confident that photography had no claim to a place in art; nowadays, they are not so sure of it; the fact is, they are joining the ranks of the photographers, and very thankful we are, for our photographic art is bettered thereby. They not only speak kindly of photographic pictures, but often become enthusiastic over the beauties of the camera, and even covet a simple portrait or landscape, for its beauty of expression or delicacy of tone.

We remember reading a paragraph in Goethe's "Sorrows of Werther" which comes in very appropriately to show how an avowed idealist does actually delight in the actual and commonplace things of nature.

"About a league from the town is a place called Walheim. It is very agreeably situated on the side of a hill. From one of the paths which lead out of the village you have a view of the whole country, and there is a good old woman who sells wine and coffee there; but better than all this are two lime trees before the church, which spread their branches over a little green surrounded by barns and cottages. I have seen few places more retired and peaceful. I send for a chair and a table from the old woman, and there I drink my coffee and read Homer. It was by an accident that I discovered this place one fine afternoon. All was perfect stillness—everybody was in the fields except a little boy about four years old, who was sitting on the ground and holding between his knees a child of about six months. He pressed it to his bosom with his little arms, which made a sort of great chair for it, and notwithstanding the vivacity which sparkled in his eyes, he sat perfectly still. Quite delighted with the scene, I sat down on a plow opposite, and had great pleasure in drawing this little picture of brotherly love and tenderness. I added a bit of the hedge, the barn door, and some broken cart-wheels, without any regard to order, just as they happened to lie, and in about an hour I found that I had made a drawing *of great expression and very correct design, without having put in anything of my own.* This confirmed me in the resolution that I had made before, only to copy nature for the future. Nature is inexhaustible, and alone forms the greatest masters."

Nothing in the whole range of art is perhaps so difficult to depict in their true relations as the sea and sky.

The harmony is so exquisite in the whole scale from high to low, that the intro-

duction of the slightest discordant element jars upon the feelings of those whose souls are tuned to its concord.

The sea, infinite in variety of changing forms and hues, unwearied in its manifestations of grace, unconquerable in power and majesty, eludes the subtle touch of the most skillful painter to catch one phase of its lovely inconstancy, any one form of its fury. Even in its gentler moods, when with soft murmurings it sports with the beached margin of the shore, so mockingly transient is the exquisite modeling of the little waves, that the eye catches only furtive gleams of the beauty.

And so of the sky. The constant play of an exhaustless energy evolves from its bosom form after form of loveliness, fleecy masses of wind-fretted clouds, soft filaments of fine spun vapor interpenetrated with changing lights, multitudes of dense white shapes wandering in thick flocks

"Shepherded by the slow, unwilling wind."

We think it may safely be said that photography has taught us more of the sea's phases than centuries of untiring observations. We know full well the limitations of photography, and the pre-eminence of painting; but let us candidly acknowledge the great service it has rendered to art by treasuring up those transient shapes of beauty which the pencil despairs to record.

The old masters, even the Venetian painters, who lived upon the bosom of the sea, give us only now and then crude little patches of green or blue, evidently intended for sea, because they place little ships upon the patches as much as to say, "this is the sea."

It was left to modern art, almost the present century, to study the volume of the moving waters for its own beauty, and not as a mere conventional background for human motives.

Turner comes very near nature. He gives the impression of mass and volubility, of transparency and mobility. He shows us the lapping and curling of the waves with their lace-like traceries, the intermingling of light and shade broken up by the little surges and ripples; but even Turner fails to catch that perfect freedom in the flow, that rollick at the top of the wave when the spray seems hardly to know which to obey, the bidding of the wind or the impatient volume of the main wave striving to gain the shore.

To judge from the average paintings of sea and sky, what a vague idea people have of what a cloud or a wave is like. A blot of white upon a scutcheon of uniform blue is passed off as the work of

"Heaven's profoundest azure."

A rolling, twisting convolution of green with dashes of white passes current for the flow of Old Ocean. These conventional ideas so blind men to the truth of clouds and waves, that when an artist who has looked at nature with unfilmed eyes, puts upon his canvas his conceptions, he is denounced by the critics for his presumption. And so when the camera gives us the sea or sky with nature's own image and superscription, we fail to render tribute to whom tribute is due.

We are glad to give our readers a most charming picture of sea and sky, entitled New York Harbor—the production of the Photo-Gravure Company, of New York. The distribution of light and shade is well managed, and the arrangement of the masses of dark and light is very effective. The repetition of the dark portion in

a minor key, while giving balance to the picture, adds much to its harmony.

We look forward with pleasure to the publication of the first number of *Sun and Shade*, which the Photo-Gravure Company promises to issue very soon. It is to be a monthly magazine, illustrated with reproductions of the best work of the camera, brush and pencil.

Judging from what we have seen of the excellent work produced by the Company, we believe the highest capabilities of the reproduction processes will be set forth in this publication.

SCIENTIFIC DEVELOPMENT OF THE PHOTOGRAPHIC IMAGE.

Presented at the Minneapolis Convention of the P. A. of A.

AT the solicitation of our President, for the practical paper to be read at the convention, I have selected the subject, "Development of the Photographic Image." I have been impressed, when examining the work of different photographers, that much of it would have been greatly improved, had the plate had treatment in developing suited to the subject and lighting. There are photographers who make the study of the development of a plate of as much importance as the lighting of the subject, and it is by such that we find produced the highest results in photography.

You may take the most perfect plate sent out by the dry-plate maker, and religiously follow his formulæ for development, but unless your own judgment is largely made use of in so preparing the developer as to suit the subject, the most mediocre results may be produced. Strength of alkaline solution and temperature at time of using are largely the controlling factors to a successfully-developed negative. The photographer may arrange the most artistic pose and lighting, and produce but a poor result, photographically, by unskillful use of his developer, and he, most likely, blames the plate-maker for the poor quality of his negative.

The fixed alkalies, potassium carbonate and sodium carbonate, in combination with sodium sulphite, are the alkalies most in use by American photographers, in forming a pyro developer. Of the two alkalies, the sodium carbonate has my preference, especially in summer time. By compounding a stock alkaline solution in the following manner, it becomes a matter of extreme subject in hand:

Take of

Sodium sulphite crystal, ...	2 parts.
Sodium carbonate crystal, ...	2 "
Water (warm), ...	10 "

This, when cooled to a temperature from 60 deg. to 65 deg. F., will be found to test 20 deg. with Baume's hydrometer. By dilution with water to one of the three following strengths, a developer can be formed more suitable to the subject than by using one strength of alkali, as is commonly done.

1 part stock to 5 parts water weighs 3½ deg. B.
1 part stock to 8 parts water weighs 2 deg. B.
1 part stock to 10 parts water weighs 1½ deg. B.

The 1 to 10 may be considered a weak solution, the 1 to 5 strong, and the 1 to 8 medium. To any one of these may be added pyro, dry or in solution, in the proportion of 1 to 3 grains to the ounce. It will be well to bear in mind that the slower

and more vigorous working plate, requires a developer strongly in alkali and weaker in pyro, and the reverse for a highly sensitive plate.

For the subjects in light colors, drapery, I recommend the 1 to 10 alkali solution from 1½ grains of dry pyro, or a half dram of 1 to 16 pyro solution, and 1 or 2 drops 10 per cent. solution of bromide of sodium or potassium, not bromide of ammonium. For general run of subjects having dark and mixed colors, the 1 to 8 alkali, with from 1½ to 2½ grains of pyro to the ounce, forms a generally useful developer. For dark colors in drapery and complexion, the 1 to 5 alkali will be most serviceable.

In conclusion I would say, that a full exposure, a weak alkali, a little bromide to the pyro, are conducive to well-modulated negatives, whereas, a strong alkaline solution gives a flat and gray negative, lacking good printing qualities.

JOHN CARBUTT.

PHOTOGRAPHY AS A FINE ART.

Read at the Minneapolis Convention of the P. A. of A.

DO photographers, as a class, realize what a wonderful and beautiful profession they are engaged in, what capabilities, progress and possibilities are found in this most fascinating art-science? Where is there its equal in the whole range of earthly pursuits? Comparatively of recent birth, not a year passes but some new and astounding discovery of its use is promulgated; and this not confined merely to pictorial representation, but running through the whole range of the arts and sciences. Where will its advancing steps be arrested? None can tell; but we may confidently look forward to continued progression into new fields of usefulness and beauty yet unexplored.

But the crowning glory of its future, whatever else may follow, the one element that is to give grandeur and dignity to its pursuit is concealed in its art possibilities. It, therefore, behooves the craft in devoting all due attention to its technique, not to neglect so essential a feature of their progress as the æsthetical. It is only by this means that the true position of photography as a fine art can be claimed and maintained. That so many persons are disposed to deny the attribute of art to photography is chiefly owing to the apathy and insensibility in this respect that exists among such a great number of the artisans of the profession, who pay scarcely any heed to its purely artistic expression.

Mere manipulative skill in producing highly-finished work is not art, although a most desirable and praiseworthy requisite in obtaining the favor of the general public. But that public is becoming day by day more cognizant of other desirable qualities, and the time is not far distant when fine polish and excessive characterless retouching will no longer serve to conceal awkward posing, bad lighting and inartistic arrangement.

Who among our photographers are alive to this awakening? Of the hundreds who yearly leave their business to attend these conventions, or of those, obliged to remain at home, that take an interest in the proceedings, through the various reports, there is much to hope from; they are at least in the line of learning the needs of the present, and can foretell those of the future. But how about the other large army of fellow-workmen who exhibit no interest in this society devoted to their advancement, and, as a rule, scarcely ever read any of the most excellent and instructive photographic

periodicals, which contain so much information that is essential to the success of a live photographer? These are among the class that argue that even though they should make their work more artistic, it would not be any better appreciated. Why waste time in giving a quality to work from which no pecuniary advantage is to be derived? But is there no such incentive as pride, dignity, or satisfaction in superior work, aside from the amount of money it will produce? Your patrons may be among those that a good likeness will satisfy, although it may be false in almost every other respect. But how about yourself? Are you satisfied? If so, it is idle to waste words in your interest.

To succeed exceptionally in any profession, one must become something of an enthusiast. But this must be turned to some practical end. If you love your profession, make a study of it in all its bearings the aim of your existence. Turn all your leisure moments to reading, not only all the purely photographic literature, but extend it into the field of art, even if it embraces subjects that seemingly have no practical connection. Seek inspiration in such writers as Ruskin and Hamerton, let your light reading be with such novelists as William Black, and seek practical knowledge in such books as "Burnet's Art Essays." Learn all the principles of art contained in the study of composition, light and shade, invention, arrangement, form, harmony, unity, perspective, etc. In these are contained the secrets of successful posing, grouping, lighting, management and accessories, and the various component parts that make up an artistic photograph. Remember that to make a fine art of photography, all this knowledge is indispensable. Its artists must have as perfect an understanding of the general principles that underlie all high art as is required by successful painters and sculptors. In other words, they must possess all the theory of the latter, and in place of their necessary skill with the brush or modeling tool, the photographer must have an equal proficiency in the use of the camera and developing tray.

We admire the dexterous ability of a proficient draughtsman. It demands a long, severe training of the eye and hand to acquire superior attainment. Yet drawing without thought or feeling is no higher in rank as an art than the use of the camera. Neither, in themselves, are more than mechanical arts. They are simply the artist's tools, the means to an end, the words by which the language of art is conveyed, and not the thoughts to be expressed. A mere copy by imitation, either with the brush or lens, might be perfectly accurate, and still be a very low order of art. But when artistic knowledge and judgment are used in the arrangement and selection of the most expressive, and in the rejection, as far as possible, of the least important and objectionable features, when the artist is inspired by love and feeling that is so guided by knowledge as to impress a personality upon his work that marks its superiority, then, no matter how humble the means, it embodies the elements that constitute a fine art, whether it be found in a photographic print, the wall paper of a Morris, the coarse clay of the potter of Tanagra, the glassware of Murano, the metal work of Benvenuto Cellini, or the canvas of a Titian.

In claiming art in photography there is no denying that it has serious limitations. It is sadly hampered in the direction of selection, rejection, invention, and in the means of technical execution. It would be as absurd to insist for it a capacity of expression in the highest realms of creative and imaginative production, as to deny it any adequate art capabilities. Yet its confines lie very near and will encroach in the

future more and more upon the province of the inventive spirit, although, from the nature of its execution, its greatest triumphs will ever remain in a realistic presentation of nature. Its appeals to the love of the beautiful and the higher sentiments, must be through an artistic representation of facts, rather than to a stimulation of the ideal. But is not this in accordance with the growing spirit of the age? Has not classicism and romanticism been obliged to give place to naturalism both in literature and art?

Because the photographer is confined to a narrower field than the painter, is he to be denied the title of artist, when, by a display of the same power and knowledge as the latter, he produces artistic results? Granting that the great majority of photographs produced throughout the country are not works of art, but are the thousands of crude daubs called oil paintings, that are hanging on our walls, any more entitled to that appellation? Decidedly, no. They are not even respectable company for the children of Daguerre. As poor as are the productions of some photographers, any of them are eminently superior to such trash, inasmuch as a mechanical production of the camera must have some semblance to nature, while a mechanical painting seldom has any resemblance to anything celestial or mundane.

But, with all the difficulties above enumerated, the photographer has some compensating advantages not enjoyed by the painter. The latter, in order to express something more than the broadest truths of nature, must devote much time and severe labor to the elaboration of details. Thus the happy inspiration of a moment is often lost in days of tedious manipulation. But the photographic artist has only to place his model in just the right light, secure a graceful pose, arrange his accessories with due regard to the composition, determine the most harmonious lines for the draperies, and watch for a favorable expression (all of which require the keenest artistic perception and knowledge), and then the mechanical lens almost instantly fixes his conception. Here is no time for shifting lights, disarranged draperies, or tired, worn expression.

Then, with the enthusiastic landscape photographer, in his search for the picturesque, how often does his artistic instinct discover beautiful views already composed by nature? Perhaps he may have a short time to wait for certain shadows to lengthen, or lights to fall into masses, so as to bring unity and breadth into his composition, or he may spend a time in search for the most favorable location for his camera, so as to embrace a foreground that will harmonize with the distance. But, this obtained, the faithful sun-god speedily records it upon the sensitized plate.

The landscape painter who wishes to obtain a transcript of this same scene, follows precisely the same governing rules in his selection. He seats himself at his work. An hour is spent in making a rough sketch, and he begins to use his colors. In the meantime a constant change has been in operation in the view. The lights and shadows have assumed new relations to each other. It is no longer the picture that first attracted admiration. Its superior picturesque effect has departed. The artist is now working from memory, and even this is confused by the new, ever-changing view presented. If he wishes to obtain anything like a finished study, he must spend several days in working here for a short time at the opportune hour. A week of cloudy weather may intervene before the arrival of another such a day when the effect is similar.

In the meantime the photographer has continued his rambles. A mass of flying clouds sweep across the heavens in an "innumerable multitude of forms," or by the restless sea the long undulating waves sweep majestically in upon the beach, or break into an infinitude of life and motion upon the resistful rocks. . . . . Snap! and another prize is won from nature's domain. How much of this flying movement of vapor or wave could the painter have seized? In fact, it is by instantaneous photography that the present-pictorial representation of the moving forms of the sea and sky have been rescued from the conventional symbolism of the past, and their wonderful phenomena produced with so much of their real life and character.

In this necessarily brief paper, the full importance of the subject can barely be touched upon, but there are very many cogent reasons, that cannot now be enumerated, why it should receive more universal attention. Suffice it to say, that, if the photography of the future does not attain a more worthy and high position as a fine art, it will be owing more to the neglect of its devotees, than through any failing in its art capabilities.

ENOCH ROOT.

REDUCING THE DENSITY OF NEGATIVES BY VARIOUS AGENTS.

Presented at the Minneapolis Convention of the P. A. of A.

OVER-DEVELOPED negatives yield hard prints, no matter how long sensitized paper may be exposed to light under them; but such negatives can be reduced to normal density, either locally or over the entire surface. To do this properly is as easy, and as difficult, as any of the important photographic operations requiring skill, circumspection, and a close observance of the process while it is going on.

When we first became acquainted with gelatine emulsion plates, owing to want of practice and experience many errors were made in the development, and in the majority of cases we produced but very feeble negatives from which, to make good prints, we learned to intensify. Others, however, were so excessively intense that printing from them in a reasonable space of time was quite impossible. To reduce undue density we resorted, in the beginning, to an old remedy that had served us well in the collodion process— a strong solution of cyanide of potassium, to which was added, occasionally, a trace of iodine.

To a certain degree this remedy proved to be quite efficient, but as its action is slow, and commercial cyanide of potassium invariably contains as much as from 20 per cent. to 25 per cent. of carbonate or hydrate of potassium, the gelatine film weakened under its action to such an extent that it sometimes even became detached from the glass plate entirely, resulting, of course, in a loss of the negative. The method might answer, however, if a chemically pure cyanide of potassium could be obtained.

To convert the excessively strong deposit of metallic silver into iodide of silver by means of an iodine solution, and subsequent re-fixing in hyposulphite of soda, is theoretically quite correct, but can be done only with much care and attention by an experienced operator. The method is worthless when the reduction to iodide has been carried on but a trifle beyond the proper point. The hypo bath must necessarily take off more of the silver haloid formed than was intended, the negative becoming, as a consequence, too feeble for printing.

Not much better did we fare with the method of reducing the silver deposit to chloride of silver by means of weak solutions of ferric-chloride. With the subsequent re-fixing in hypo, no more reliable results can be secured with this method than with that of iodide of silver. It is true that the conversion of the metallic deposits into chloride of silver has proved to be very useful in removing green and red fog, or discolorations of the film, excepting those caused by sulphides formed; but before a print can be made from the negative thus transformed into chloride, a re-development with ferrous oxalate must be resorted to, which, however, by no means reduces the original density of the plate, but increases it perceptibly.

Reducing through the transformation of the silver into chloride, is risky for many reasons. To judge approximately correct of the degree of the reduced intensity before re-fixing the plate requires a most experienced eye. An insufficient amount of chloride formed necessitates a repetition of the process, and when it is excessive, the whole proceeding results in a failure and the loss of the negative. If the negative has been primarily perfectly washed, the transformation into chloride of silver progresses uniformly and slowly, but the presence of a mere trace of hyposulphite of soda is an obstacle to success. Ferric salts (ferric-chloride) are reduced to ferrous by hyposulphurous salts, and if the negative has not been totally freed from the fixing agent, reduction into chloride can take place but imperfectly, or not at all.

Reducing agents containing principally iron chloride, and similar substances have been frequently proposed for practical use, and are, in fact, prepared and sold with great praise of their virtues. Apparently these media act well, slowly, and uniformly enough to allow of a perfect control, and with satisfaction to the casual observer. The chloride of silver formed, however, remains in the film, as it is not removed by fixing, as in the previous cases. What will become of a negative reduced in that way, if a large edition is to be printed from it, I leave to every printer to decide.

Cupric chloride, formed when cupric sulphate and sodium chloride are applied to the negative, is just about as unreliable as any of those previously mentioned. The action is based upon the same principles. Owing to the copper salt the deposit formed assumes a non-actinic color, and unless the silver chloride is fixed away, and not even then, can great success be expected from the process. Dr. Eder has constructed a negative reducer, consisting of cyanide of potassium, iodide of potassium and mercuric chloride. Its action is similar to those we have considered, but an excess of cyanide of potassium dissolves the respective chloride, cyanide and iodide of silver formed, thus effecting the desired reduction of the negative deposit. Eder's solution is easily controlled in its action, but the reduction takes place slowly, an hour, or even longer, being requisite to reach the desired effect. Hence, this process, with all its advantages, can never become quite popular in a very busy laboratory.

Farmer's solution, consisting of a mixture of ferricyanide of potassium and hyposulphite of soda, is probably the most generally accepted method to reduce over-intensity in negative deposits, as well as in printed paper proofs. It is controllable and safe, leaves no color-stains behind, and acts with such an energy that, after a short application, the whole silver deposit may be totally destroyed, leaving upon the glass a pure gelatine film without the least trace of an image. When ferricyanide of potassium, itself sensitive to light, is mixed with hyposulphite of soda, and then ex-

posed to diffused light, only for a short time, the mixture will turn blue, and, owing to a separation of sulphur, turn milky. A part of the ferric salt is reduced to ferrous, hydroferricyanic acid formed, sulphur, Prussian blue, and probably hydroxide of iron, separated. Under the influence of light, Farmer's solution will soon become inactive, and should therefore be applied only in the dark-room, or in a much subdued light. With proper precautions the solution has proved to be extremely active, and as its energy can be well controlled with the greater or less amount of the ferricyanide of potassium used, it has been almost universally adopted. The process is truly chemical; the ferricyanide of silver forming is dissolved in the hyposulphite of soda.

As a reducer for negatives it is effective when the general density of the plates requires modification, or when only a local reduction is desirable. The solution, mixed with strong gum-arabic mucilage, and applied with a soft brush to the parts to be reduced, gives, with a little care and dexterity, all desirable effects. Halation marks, excessively developed whites, and even flare spots and ghosts have been removed or subdued by it. For the reduction of paper prints, it is best to soak them in hypo solution and add gradually to it but small portions of the ferric salt.

Less successful has been its application to the Eastman permanent bromide paper, which, more or less, assumes a yellow tone with it. The method now to be spoken of gives more satisfactory results.

Not less effective than Farmer's solution, and preferable to it in many respects, is the method with potassio-ferric oxalate, proposed by Monkhoven, introduced and made practical by Belitski. Its peculiar virtues are that even by long-continued action no trace of color is left behind, therefore it is more useful in reducing gelatine paper prints, like those upon the Eastman paper. It acts probably slower but more steadily than Farmer's solution, but as the action begins only when the entire film has been penetrated by it, reduction must not be carried to exactly the degree of intensity required, but somewhat below it; the solution continuing to act within the film for some time after the operation has been interrupted by washing the plate. Potassio-ferric oxalate is the beautifully green crystallized double salt of ferric-oxalate and oxalate of potassium, which is formed by oxidising our ordinary ferrous-oxalate developer. If this highly energetic developer is exposed to air but a short time, the active ferrous salt takes up more oxygen, becomes ferric and ceases to be a developer. Hence, old or partly oxydized developer is quite frequently used as a restrainer, or to commence the development of plates suspected of over-exposure. By higher oxidation the oxalate developer loses part of its energy (ferric-oxalate does not develop). If, therefore, the ferrous salt remaining in the solution in lower quantity does the work, would it not be as well to apply for this purpose a freshly-prepared ferrous solution containing an amount of the iron salt equivalent to that existing in the oxidised solution? But this does not seem to be the case. A peculiar virtue is displayed by the salt of higher oxidation; it possesses a restraining power by which most excessive over-exposures can be well controlled. The ferric oxalate does not develop; it restrains, and will ultimately, under certain conditions, reduce the metallic silver deposit on plates developed with any of the known developers.

Before we consider the action of this reducer, it may be as well to describe the sources from which the valuable and beautiful salt is obtained, the more so as many practitioners have been prevented from using it on account of its scarcity, or by being ignorant of its mode of preparation. Old oxalate developer exposed to air in open

vessels will, after a short time, deposit potassio-ferric oxalate in the form of green crystals; it will do quite well to separate them from the solution, remove the brown iron oxide adhering by washing in water, dry the crystals between the bibulous paper and preserve them for use. But if it is desirable to recover the whole quantity of the salt, proceed as follows: Take the whole amount of old developer on hand, pour it in an evaporating dish and allow it to evaporate spontaneously in a subdued light. The resulting brown, powdery mass, interspersed with a multitude of green crystals of various size, is then to be mixed with one-tenth or one-fifteenth of its weight of crystallized oxalic acid, and, with five or six times its volume of water, boiled in an evaporating dish. The resulting thick and muddy liquid is filtered into another evaporating dish while yet hot, the dish covered up with paper, and set aside in a cool place over night. From it form beautiful crystals of a pure emerald-green color —the potassio-ferric oxalate.

The salt is sensitive; light reduces it again to ferrous-oxalate; it must, therefore, ke kept in the dark. The salt can also be prepared by adding to a weak solution of ferric-chloride another weak solution of neutral oxalate of potassium, filtering the solution and crystallization. It is necessary to add enough oxalate to secure perfect neutralization. An excess of it will soon precipitate; an excess of iron chloride renders the resulting salt unfit for use.

The formula for reducing is simply to take 10 parts of the green crystals in weight, previously dissolved in as little water as possible, and add it to 100 parts of the ordinary hypo solution. When an over-intense negative is subjected to this compound, the reduction will take place slowly but perceptibly, and the process can, therefore, be easily controlled. The hyposulphite plays an important part. Without it the potassio-ferric oxalate does not reduce. A negative perfectly free from hypo may rest in a pure solution of the green salt indefinitely without any apparent effect, Remove the negative to a weak solution of hypo and reduction will commence at once. Hence, it will be apparent that washing after fixing is not at all necessary when the negative is to be reduced.

The chemical process taking place has not been definitely stated, but the method is so secure, controllable, and in no case discoloring the plate, that it may well be considered of much practical value, more valuable, perhaps, than any other reducer.

I must not omit to mention, in connection with the chemical reducers which we have considered, one whose action is merely mechanical. I refer to the method of rubbing down excessive intensity by means of a linen rag moistened with alcohol. Friction reduces density by taking off particles of the silver deposit. The intelligent negative-retoucher can by this means produce very fine effects and make visible modulation quite obscured upon the crude negative.

CHARLES EHRMANN.

AUGUST 20th is the last day for receiving for the Vienna Exhibition. The exhibition opens September 18th.

September 19th is the last day for receiving pictures for the exhibition of the Photographic Society of Great Britain, 5A Pall Mall.

PROGRESS OF PHOTOGRAPHY.

Report to the Minneapolis Convention.

Mr. President, Ladies and Gentlemen of the Photographers' Association of America:

IT has been my misfortune to be selected by your Executive Committee to present you with a report on the Progress of Photography during the past twelve months. If I do not report anything very astonishing, you must charge it to one of two things —perhaps both, viz., that the progress of photography has been so gradual as to make difficult the task to formulate a report of its progress during the passage of one short year, or else your committee has made a grievous mistake in their appointment.

I will be as brief as possible, endeavoring to make myself heard by the farthest member in the hall, therefore, what I lack in enlightenment, I will endeavor to make up in noise.

Photography may now be divided into several distinct departments.

Portrait photography, being confined to professional artists who earn their living by their business.

Landscape photography, followed by professional photographers and amateurs.

Scientific photography, practiced for the most part by salaried men, but quite freely indulged in by amateurs.

Micro photography, properly included under the above heading; and

Stellar photography, which is directed to the object of discovery in the realms of space, heretofore explored only by the telescope and mapped by drawings made by hand.

Stellar photography has made considerable progress; the governments of the world have taken it under their patronage, and we may look for wonderful developments in this direction, or at least our great-great-grandchildren may. There will be placed in observatories, in different parts of the world, ten instruments of about eleven inches in diameter and about twelve feet focal length, for the purpose of photographing and mapping the heavens; when the parts are placed together, the whole will comprise a complete photographic map of the starry universe. As these instruments will be controlled and operated by men of undoubted zeal and ability, great things are hoped for.

Orthochromatic photography has made some advance, yet not so great as it should have done, or as it will do in the twelve months to come; photographers have been slow to appreciate its great advantages. Orthochromatic gelatine dry plates are now on the market, possessing good keeping qualities and of extreme sensitiveness.

Dr. E. Albert, of Munich, publishes a formula for orthochromatic collodion emulsion, which is said to produce plates as sensitive as any gelatine plates now on the market, easy of preparation, and can be used wet or dry. Should all this prove upon trial what is hoped for it, photographers can have the pleasure and profit of making their own plates, as in the old wet collodion days.

Plates prepared orthochromatically are invaluable for many purposes, and desirable for all.*

* It is surely an unintentional oversight on the part of the author to neglect mentioning the great service of Mr. Ives in orthochromatic photography.

In the direction of photo-mechanical printing there is little progress to record, so far as quality is concerned; the proofs of to-day are but slightly in advance of a year ago, but there is a marked improvement in the demand for this class of work; as the demand increases the quality will also increase, and uses will be found for them not thought of at present.

I can report no progress in portrait photography. The suicidal policy of price-cutting, adopted by the leading and well-to-do galleries to kill out their poorer neighbors, has produced evil effects, and poorer work is the result.

Instantaneous photography at night by aid of artificial light has many devotees, and not alone among amateurs. Magnesium in some form or other has been the main source from which the light has been obtained, and many and varied are the devices put upon the market for flashing the powder. Of late a new candidate has made its appearance, which bids fair to out-rival all others. I refer to the nitric oxide gas-flash, of which mention has been made in the different journals; it produces no smell or smoke.

Diffraction photography, the name given by Dr. John Vansant to photography without a lens, is receiving considerable attention, and is destined to prove of great value in the arts and sciences.

Photographic objectives.—Two recent improvements in this line are by Messrs. Voigtlander and Dallmeyer. The former having constructed a new portrait lens, one of the chief merits of which is that it is absolutely rectilinear, and is said to be the first rectilinear portrait lens ever placed upon the market. The glasses of both front and back combinations are sealed, so that all diffusion and loss of light by reflection is successfully overcome. The focus is longer than heretofore, which enables the operator to pose his sitter farther from his instrument than has been his wont, thereby securing portraits which excel in correct and faithful reproduction of the features, brilliant and equalized illumination, true perspective and perfect definition, together with that round, soft stereoscopic effect which delights the eye of every true artist.

Photographers who do much at viewing have observed the fact that while their single lens would give fine, brilliant negatives of forest, rock and river views, architectural work required a different instrument.

Thanks to the advance made in the construction of photographic objectives, one lens will now accomplish all the above to the entire satisfaction of the most critical, Mr. Dallmeyer having invented and placed upon the market a single lens, which is absolutely rectilinear, producing great brilliancy and no "lapping lines."

In this new lens, the concavo convex and one meniscus are fitted together, while the second meniscus is reversed so that a double convex space (if such a term is admissible) is left between them. The lens sets back in the tube with the diaphragm in front; the angle is about 65 degrees.

Developers.—Several new substances are being put forward for developing the latent image on the exposed plate; foremost of which appears to be hydroquinone, as that chemical possesses good keeping qualities and is energetic to the last drop. We may look for it to become a general favorite; another thing being in its favor, that it can be prepared and used as a one solution developer, preparations of the kind

being already upon the market. It will be well for photographers to give hydroquinone a trial.

Self-developing dry plates are now manufactured, upon the backs of which is a coating of some kind that holds a prepared pyro developer, therefore, all that is necessary after the plate has received the proper exposure is to immerse it in a dish of pure water. Of the practicability of such a mode of working I am a little skeptical.

Photographers having learned how to better fix their negatives, there is less complaint of deterioration, and more durable negatives are the result.

Plain paper.—There is a tendency among photographers to return to the use of plain paper for contact printing, in order to do away with the so-called inartistic polish of the albumen surface. It is more strongly advocated in foreign countries, and more largely practiced. Albumen paper, however, will continue to be used, at least, for another twelve months.

The metric system.—Although not alone pertaining to the progress of photography, yet it is a subject agitating the minds of the fraternity the world over, and many of our best formulæ are published in that system; therefore, a remark or two upon this subject may not be out of order. While I shall not advocate either the metric or our own system of weights and measures, still there is great room for improvement in the latter.

A commission has been appointed to meet in this country for the purpose of adopting some means whereby the metric system shall be put into more general practice in the United States. Said commission will meet some time during the present year. Perhaps it would not be out of place for this convention to give expression upon this subject.

Schools for photography.—Germany has taken the lead in establishing schools, or, more properly speaking, colleges of photography;—one in Berlin, in charge of H. W. Vogel, and another in Vienna, in charge of Dr. Eder. These colleges are supported by the Government, the price of tuition being very small. Large and handsome buildings have been erected for the purpose, containing departments for every branch of the photographic art, where pupils can secure a thorough practical as well as theoretical knowledge of the business in all its branches, or those only he or she may elect to study and practice.

It is to be hoped that some influence will be brought to bear upon our own Government, whereby some of the surplus millions now in the treasury might be applied in the same direction.

The photographic journals remain about as they were one year ago, shedding abroad their light among the hive of workers, that all who wish may improve themselves.

There are, no doubt, some things of importance that have been overlooked, but as I have already occupied more of your time than I intended, I will thank you for your kind indulgence.

W. H. H. CLARK.

AT the suggestion of Dr. Elliott, the editors of American photographic journals will hereafter express all formulæ in the denominations of the decimal system, together with English equivalents.

TRANSFEROTYPE PAPER.

Read at the Minneapolis Convention of the P. A. of A.

SINCE the meeting of our convention, a year ago, many useful and valuable discoveries and applications of photographic principles have rewarded the earnest research of the many enthusiastic devotees of our art. Among them are, perhaps, none of greater importance, and destined to occupy a field of greater usefulness, than Transferotype Paper. Its many and diversified applications, and its unprecedented popularity, considering the short time it has been before the public, I think sufficiently indicate its importance and interest to the fraternity to justify a short paper explaining its manipulation.

Transferotype paper is a paper destined for positive printing, prepared on the same principle as the American film, being an insoluble sensitized emulsion coated upon paper previously prepared with a substratum of soluble gelatine. Prints can be made either contact or enlargement by artificial or day light, and should be developed with oxalate and iron developer, and treated in precisely the same manner as bromide paper, the same formulæ being used for the developer, clearing solution, and fixing bath. After the print is washed in, say, five or six changes of water (in warm weather ice water is necessary), the print may then be transferred to any surface that will resist the action of hot water, the method of procedure being as follows: Take a sheet of porcelain, plain glass, or such material as is desired to transfer the picture to, and after washing thoroughly, and while wet, place the print (which must also be wet) face down and squeegee in contact. Remove as much of the moisture as possible by wiping the squeegee on a cloth between strokes, then place under pressure with a sheet of blotting paper next to the print. After thirty minutes it will be ready to strip, but may be allowed to dry thoroughly, and will strip with just as much ease, the only difference being that the water must be hotter when the print is dry. Take the plate containing the print, and put into a dish containing water at a temperature of 110 deg. F. when the print is wet, and 120 when dry; allow it to *soak* about two minutes, and then, with a pin, pick up one corner of the paper, being careful to avoid touching the film. If the water is of proper temperature the paper will separate readily, and can be removed with ease and certainty, and without any injury to the picture, which it leaves on the plate. In case the paper does not strip easily, add hotter water. After removing the paper, take a tuft of cotton, dip into the warm water and wash the surface of the picture carefully to remove any remaining substratum. The plate should then be put into an alum bath for a minute or two, then rinsed under the faucet, and after passing the squeegee over the print very lightly to remove the surplus water, put into a rack to dry.

The great number of uses to which the transferotype paper may be applied is quite remarkable. Among those materials to which it has been transferred successfully are porcelain, china, wood, papier maché, canvas, ivory, celluloid, leather, silk, gold, silver, nickel, shell, iron, brass, tin, marble, and plain and ground-glass.

For pictures which are required to be looked at in reflected light, the print should only be developed to that strength that you want it to retain when transferred. But if the picture is desired for the purpose of transferring to lamp shades, window panes, or where transparencies are desired, the print must be developed very much darker, and can only be judged correctly by looking through it as in developing a

negative. In this way the most beautiful transparencies and lantern-slides can be made. For window transparencies, the better way is to transfer to plain glass and back up with ground glass, turning the film side toward the ground glass, thus protecting the surface as well as giving an unreversed picture.

Prints made by contact, after being transferred, will be reversed. In making enlargements, this can be easily avoided by reversing the negative in the camera. If an unreversed picture is required on porcelain the same size as the negative, it can be done in the ordinary manner of making transparencies with the camera by placing the negative in the window, back toward the lens, and using the paper in the plate-holder, in which case the ordinary film-carrier is used to hold the paper. Perhaps the most important use to which this paper has been put is to transfer to artist canvas. By this method the most brilliant prints can be obtained, fully equal in strength and detail to enlargements on paper, an achievement that has not been accomplished heretofore by any other process.

To prepare the canvas for transferring use :

Whiting, 5 ounces; warm water 5 ounces; mix to a cream and add gelatine (white hard) 1 ounce, dissolved in 6 ounces of water; mix thoroughly and add glycerine, 1 ounce; chrome alum, 60 grains, dissolved in water, 5 ounces.

Apply quite warm water with a sponge, going once over. When dry, sandpaper down smooth, Give two or more coats, sand-papering each time, till the desired surface is obtained.

In making solid prints, where rich blacks are desired, a good plan is, after wetting the print in plain water before development, pour off the water and soak for a moment in acetic acid clearing solution, following this immediately with the developer. This will not only preserve the blacks, but the paper takes up sufficient of the acid to prevent precipitation of the iron during developing, thus preventing yellowness. This method also applies to the use of bromide paper.

New applications are constantly being found for this useful photographic paper. Recently it has been adopted by the calico print factories for transferring the patterns or designs to the metal plates for engraving with satisfactory results. Formerly the designer was obliged to draw his pattern the exact size requisite when printed, duplicates being required one for each color used. With the valuable aid of transferotype paper the design may be drawn on a small scale, a negative taken, and then enlarged prints made, one for each etching plate required. The prints are then transferred to the zinc and the pattern etched through the film. At first it was feared that the expansion of the gelatine when wet would change the drawing of the design and prevent the impressions from the different plates from registering correctly; but this fear proved to be groundless, as it has been found that the several prints swell when wet and contract when dry exactly alike, and are found to register accurately. This opens up a new and extensive field for the use of photography.

Wood engravers have long felt the want of a reliable, simple and cheap method of photographing on boxwood. All the methods that have been in use heretofore have been so difficult and generally unsatisfactory that they have been but little used. With the transferotype paper the difficulty is solved. The manufacturers are now making a special paper for this purpose, the only difference from the regular paper being that the coating of emulsion is very much thinner, so that when transferred to the wood an exceedingly thin film covers the wood, which with the application of a

little glycerine is rendered capable of being engraved for the finest line work without chipping or forming an appreciable difficulty to the engraver.

For lantern-slides, transferotype paper is particularly well adapted: I have recently given demonstrations before the principal photographic societies throughout the country, where I have projected pictures upon the screen from slides made in this way, where they have received the highest praise, and have invariably been acknowledged fully equal to the best glass slides.

But the main question with probably a majority of my hearers is, what practical use can we put it to in the studio, whereby our receipts can be increased? There are several ways in which it may be made of practical value. First, in transferring to opal glass. The print is quickly and easily made, and the transferring as simple as the result is beautiful. The cost is small. For 4¼x6½ opal or porcelain pictures the cost for material is but a few cents, including the opal glass. Pictures can be transferred to watch-dials, or the inside gold watch case, the bright burnished gold forming an excellent ground and making a novel and interesting result.

The film, when transferred to porcelain or opal glass, forms an excellent surface for finishing, either in water color, India ink, crayon, or pastel.

With the ease and certainty of the manipulation, the great diversity of its applications, the surpassing beauty of its results, and low cost of the material used, bespeak for transferotype paper a success and future usefulness that can hardly be overestimated.

H. S. BELLSMITH.

DARK-ROOM PRACTICE.

Presented at the Minneapolis Convention of the P. A. of A.

OUR esteemed president bestowed the honor upon me to invite me to write a paper on our dark-room practice: only some "practical bits," as he called them, in order to have some questions asked and discussions had on them. I feel much honored, indeed, by the distinction, but I do not feel myself up to the requirement, and especially in an assembly of so many of our illustrious brethren, who have won world-wide reputation in the craft. Our president's wish is an order, though, for me, and I will try my best to relate some practical observations of my own, without guaranteeing them to be strictly in accordance with chemical law, for I do not pretend to be a chemist.

Our president wants me to speak about our dark-room manipulations. I will, therefore, strictly adhere to his wish, and ventilate the dark-room. Ventilation is, indeed, the very first item to discuss, for it means health. With the advent of dry-plates, though, this question is brought back to a second degree of importance, except where still the wet process is used for copying purposes, or tintypes are made; for we do not stay very long in the dark-room, and we have no more poisons like cyanide and others to deal with and undermine our health.

It is good policy, though, where room and situation admit it, to use any kind of ventilation which will close out white light and let come in some fresh air, especially on hot summer days. If constrained by space and situation, leaving open the door of the dark-room, when not in use, will settle this part of the question.

The light in the dark-room is, then, the first vital question. I believe in plenty

of it, provided it is non-actinic enough to allow handling the plate with impunity from fog.

I condemn entirely the source of daylight for illuminating a dark-room, for its changeability, at all hours of the day, just as well as the lantern light inside the dark-room, though the lantern has the advantage over the first, in giving a steady light, which enables the operator to become soon expert in judging the intensity of the negative; but it has the enormous drawback of its insupportable heat in summer, beside the smoke and smell, at any season injurious to the health, whatever light you may use. I am strongly in favor of artificial light of any description, provided it is fixed outside the dark-room; better so, if you can manage it from the inside, according to the amount of light you are in need of. A gas jet, or coal-oil lamp, fixed far enough from the dark-room not to break the glass by heat, will answer the purpose.

Ruby glass or paper, although injurious to the eye, is still the safest (if we are bound by the space to work close to it) according to my practice; but, considering that the light increases or diminishes in the ratio of the square of the distance, by going farther away from the light we might use a light less safe than ruby, viz., orange, yellow, or cathedral green. I prefer one, two, or all three of the latter combined, according to the size of light and dark-room. With the very sensitive plates of our day, I find it necessary to begin developing away from the light, or to screen the light down by a cambric curtain of orange color, and, as soon as the image appears, I admit more light, to fully ascertain the progress of the latent image. The very start of the latent image enables the observing operator to judge the amount of exposure. If right or wrong here, too much attention cannot be paid to the coming negative. On this very first care or carelessness depends entirely the quality of the future picture.

The proverb, "Better late than never," is entirely inapplicable here, and must be kept in mind as altogether out of place. It is, according to my notion, impossible to give the effect to a negative by any known "after treatment" which you can give to it by judicious developing.

To ascertain the right exposure of a plate, I find it a good practice to start with the formula found to answer the best for a rightly-exposed plate. This seems to me a practical guide to recognize the amount of exposure received, and can easily be modified to the want of the effect sought for; for an over-exposed plate can be developed to yield the effect of an under-exposed plate, by starting with too much pyro or bromide in the developer or *vice versa*, and, if mixed by ignorance or carelessness, the components of the developer might deceive you in the treatment of the negative.

A good dark-room man must, of course, understand how to develop a plate without any knowledge of exposure received,—I would even say, without the use of any scales to weigh his ingredients, but I will only speak of our every-day practice. I believe strongly in slow developing, viz., rather weak developer, for many reasons.

Should the negative show signs of under-exposure we are in the very best way, for it is generally known that a dilute developer precipitates the bromide of silver acted upon by light in a finer state of metallic silver, which forms the latent image and insures a good range of half tone, softness and roundness, with atmospheric effect. The developer penetrates slowly but gradually, and forms the picture in the film, which gives bright and sparkling negatives. It is a known fact that cold solutions

act slower than warm ones. Heat can, therefore, safely be considered an accelerator. This reason holds good with under-exposed plates.

In an under-exposed plate, as everybody knows, the shadows are tardy to respond to the action of the developer. Therefore, by applying heat to them, we are able to bring as much out of them as the light fallen upon them gave impression before the sensitive film. This is found very practicable by simply breathing upon parts of the negative. Another way, equally good, is to throw solution from the developing tray into the graduate, and to pour it gradually back upon the plate over the part that you wish to give more intensity of detail.

To produce a good negative in every respect, we must have patience, and not condemn a plate because it develops slowly, for the more sensitive a plate is the slower it has to be developed. A slow plate stands a stronger developer. I think it is wrong to say a good plate has to be fully developed in three minutes. No time can be laid down as a rule to produce a good negative. Before exposing a plate, a good photographer takes all the time he needs to study his sitter, to find out the best outline of the face, pose, and light to suit the subject, in order to obtain a perfect picture. Give your dark-room man the same chance of study and success by giving him time. Do not rush him through, by saying, as I have heard so many times, "My best pictures came out like a flash and were developed in three minutes," for the statement, if true, was an exceptional one, and cannot be applied to every negative and every subject, although it is a fact that a plate which has received an exact exposure takes less time to be developed than a plate which needs doctoring. If the exposure were right, you have nothing lost by slowly developing. You have the pleasure of seeing your negative build up with sparkling effect. Should the exposure have been a too-prolonged one, you are again in the only safe way to save the negative from spoiling, for you have plenty of time to modify your developer to suit the exposure, without any danger that your plate will have developed too far during that time. I say, therefore, "Go on slowly." "Chi va piano, va sano; e chi va sano, va lotano" (Who goes slowly, goes safely; and who goes safely, goes far), says an Italian proverb, which cannot be better employed than in developing.

A strong developer precipitates the bromide of silver in a coarse grain, disturbed, if I dare say so, by the action of light. The picture flashes out, the developer does not penetrate the film, and though the negative looks quite dense, we are quite astonished to find, after fixing, a flat and thin looking negative. The depth of tone in the negative is lost. It is exactly the same way as in toning prints very quickly, with a good deal of gold, when the gold did not penetrate, and stood only on the surface of the picture. Though the print looks quite blue, it changes to a disagreeable red in the fixing solution, and proves only that you are deceived. I know I will raise a good deal of contradiction among our brethren, and perhaps more from the plate manufacturers themselves, with the following statement: I do not believe much in the virtue of restraining an over-exposed plate with old developer, or in the use of it to replace the bromide. My practice has taught me that the use of old developer gives of course more intensity, and makes developing slower, but at the expense of cleanness of the shadows. To ascertain the truth of my assertion, I beg you only to give the matter a comparative trial by cutting a plate in two, and developing one half with the mixture of old and fresh developer, and the other half with a little

more pyro and bromide in the new developer. I am convinced you will decide in favor of my statement. You will find in the latter case beautiful clearness and definition in the shadows, with purer high lights in comparison with the first half.

Softness and gradation from the high lights to the deepest shadows, are considered a fine chemical quality in a negative, and with reason, for the effect adds so much to the beauty of the finished picture.

I find no difficulty in getting the said effect by stopping developing a trifle sooner than I would consider fully developed, and without draining, putting the plate in a tray of water, merely to cover the plate before washing, or wash the plate under the tap with a gentle, slow stream of water. In both cases the developer being very much diluted, or washed out gradually, the dilute developer in the film will continue its action as long as an atom of it is in the film; and by the same law and effect of dilute developer, will act with benefit on the shadows, and form those so highly prized half-tones and gradations in light and shade. You will easily recognize by this method the difference gained in intensity, and the beautiful effect obtained after the plate is fixed.

The temperature of the chemicals merits, too, our attention, and a good operator will always look out that his stock solutions do not freeze in winter, and his developer does not get too warm in the tray in summer. Frequent changes of temperature act destructively on solutions, therefore it is well to keep the developing bottles where frost cannot reach them in winter. Should the dark-room not be warm, it is easy to keep them well enveloped, and covered in straw. To prevent frequent changes of temperature, I do not advocate keeping developing solution on ice in summer, unless it can be done night and day, but I prefer to dilute my developer before use with ice water, and, if possible, put a piece of ice in the developing tray, to keep the developer from getting warm by the imprisoned warm atmosphere of the dark-room. At the last year's convention, in Chicago, our esteemed president, Mr. G. Cramer, gave you a description of how to get rid of frilling in summer, and insuring a perfectly hard film, not easily scratched, even with the finger nails, which would stand a washing of 42 hours or more. This *was* and *is exactly* my practice for many years, which I can recommend to the fraternity with much assurance and success. The enormous amount of alum in the hypo may not be in accordance with chemical laws, but I am strongly convinced of its practical value.

Remaining yet the question of reducing and strengthening. The safest way to reduce a negative that I know of, is undoubtedly hypo and ferricyanide of potassium. Any local reducing can be done with equally good result with a soft brush, by washing under the tap after each application to insure evenness and local reduction. Much has been said and written about strengthening. There are thousands of formulæ, and, without doubt, all good in skillful hands, but the simplest, it seems to me, is the one with bi-chloride of mercury, mixed with bromide of potassium, and followed with sulphite of sodium, instead of aqua ammonia. Stronger ammonia imparts to the negative an unpleasant brown, yellowish color, which injures a good deal of its printing quality. Sulphite of sodium does not change the color of the negative at all, it is more stable and less injurious than ammonia, and therefore preferable. But the negative has to be removed as soon as fixing is complete, otherwise the sulphite of sodium will reduce again the intensity of the negative.

This intensifier has the advantage of intensifying more the high lights than the

shadows in the proportion of bromide used. A good way to strengthen a very flat looking negative is, I find, to first reduce the negative with ferricyanide of potassium and hypo, as above described, and then strengthen, as said further up. If only moderate strengthening is required, drying the negative by heat is a handy intensifier; but you must not put the negative too near the stove, and melt the film, as happened to me once last year at F. W. Guerin's.

J. HEGYESSY.

PHOTOGRAPHIC OBJECTIVES.

FACTS AND FALLACIES REGARDING THEM.

THE literature on photographic optics is exceedingly meagre, and that which is open for study is distributed mainly in the form of papers and articles written in photographic journals.

The terms "depth of focus," "distortion," "chromatic and spherical aberrations," "visual and chemical foci," are used rather promiscuously, and I fear not always understandingly.

It is not my purpose to give you a treatise on optics pertaining to photographic lenses, but to mention those terms, and give explanation of them, which meet one in pursuit of photography, and draw attention to some things which, from my experience and a varied correspondence, I am led to believe are not fully understood by all. The diversity of qualities pertaining to lenses for photographic purposes is apt to be confounding unless a person has the benefit of extended experience or study on the subject, and there is no question that the assumption of knowledge where it did not exist, or relying on statements which were not correct, has led to many errors of judgment which in turn have been the cause of disappointments, prejudices, and loss.

I therefore think that any statement of facts which are incontrovertible, because they are in conformity with natural laws, will not only be fruitful of a better knowledge, but may, in time, lead to some unity of action in the mode of examining and testing objectives, for I venture to say that there is a necessity for this, inasmuch as different persons follow different plans, giving varying results, and few of them accomplish the completed result.

It may be best to say at the outset what the qualities are which are involved in a first-class photographic objective, and which, with many others, are the problems for the optician to solve. They are as follows:

Exact coincidence of visual and chemical foci; a formulæ involving such glass and curves as will give the utmost freedom from spherical and chromatic aberration; such a relation of glass and curves as will avoid internal reflections and consequent "flare" or "ghost"; length of focus; diameter of lenses; absolute homogeneity of glass, or freedom from striæ or veins; grinding and polishing the various surfaces so that they shall be strictly spherical; absolute centering of lenses before and after mounting.

I cannot think that I can better show the importance of these various factors than by leading you through the process of completing a lens, omitting the minutiæ of work, and thus also showing you the difficulties which beset the path of the optician in his endeavor to reach the result.

We will assume that he desires to make a medium size objective of the form which is principally used to-day—a system of two symmetrical combinations, and that he has laid out the formulæ on which he intends to construct it, in advance. He has in his possession four plates or disks of rough and unsightly glass, two of which are crown and two flint, which are to be to him the cause of disheartening failure or gratifying success. If he has any experience at all he will use no other than such as is warranted by the glass manufacturer, because even then he will find considerable difficulty in obtaining perfect glass. The glass comes from the manufacturer either guaranteed or not; in the latter case he assumes no responsibility, while in the former he does so far as the refractive index and most glaring faults are concerned. If they are of guaranteed form, the disks have facets ground and polished on the edges on opposite sides by means of which the maker has carefully tested the glass and by which means the optician may do the same. I would say here in parenthesis that none of this glass is produced in this country, and none of the glass manufacturers with whom we have yet come in contact have shown any inclination to undertake to make it. We hope and feel confident that the time will come when it will be made within our borders, and, when so, with the natural facilities at our disposal, we feel certain that we shall obtain a higher and more satisfactory result than exists to-day. The cost of the glass is now a very important factor in the price of the lens. The glass itself must, of course, conform to the formulæ, and often the formulæ must conform to such glass as it is possible to obtain.

Any variety of crown or flint may be obtained, but it has been found that the light flints and crowns give the most satisfactory results. Flints are usually the outer lenses of double combinations, and, when heavy, are exceedingly soft and subject to oxidation.

The optician now begins to abrade the glasses, giving them approximately the form he wishes them to have, and then begins the process of grinding and polishing.

Although this is done on the same general principle, the details vary with different opticians, and, although the same result may be and is accomplished in different manners, it is safe to say that if one were to follow the plan of another he would fail. There is a peculiar touch or feeling in doing this work, which it takes years of practice to acquire, and even then I find a person must be adapted to it. One might give the method of procedure down to the minutest detail, and this has often been done, and for all that a person might follow it any number of times and still fail. One thing, however, is true, that few persons have any conception of the amount of exactness which is required in this work. This remark, of course, applies mainly to an objective which is to be of the highest standard, and which, to a certain extent, varies with different opticians according to their skill, and not to such productions as may be called commercial, for the reason that the pecuniary return and not excellence is the paramount consideration. A certain amount must be observed in the cheapest form, but they are not subjected to critical tests, and any faults which are not apparent to the purchaser are allowed to pass, which is not the case in the highest grade where the best is none too good, and the result is, of course, that they are inferior, varying, and unreliable, and while occasionally one may find an excellent lens among them, no reliance can be placed upon them. It has been computed that an error

or variation from the spherical surfaces, for instance, so infinitesimally small that there are no mechanical means for determining it, say of a 1–500,000 of an inch, will have a noticeable, and sometimes disastrous, effect in the formation of an image. We all know, from the fact that we have read it often, of the great exactness with which telescope objectives must be made, and the claim is generally made that because the image from the objective is magnified by the eye piece, a greater perfection is required in the telescope objective. I have found, however, that any lack of perfection which is noticeable by an eye piece is as pronounced in the camera, and I therefore claim, and make this emphatic, that a first-class photographic objective requires as much perfection as that in the telescope or microscope, and no work spent upon it to accomplish this result is lost.

To return to my objective. We will suppose that all the surfaces have been ground and polished. This in practice means considerable. The difficulty of doing the surfaces increases out of all proportion with the increase in size, as well as the danger of scratching. It is an ordinary event to scratch a surface during the process of grinding and polishing, and nothing uncommon to do so in the last stages of the latter when the entire work must be repeated. No matter how good a surface may otherwise be a scratch is inadmissible; not that it does any particular harm, but an optician who takes pride in his work cannot bear it, and the customer who is to pay for it will not accept it. After polishing, the lenses are put into a lathe, one by one, and centered, that is, the optical axis is found, which we know we have when, on revolution of the spindle, the two images which the surface gives are stationary. The edges are now ground down to the same diameter as the cell in the mounting.

The next step is cementing. This is a delicate process, for although in each part of the work heat has been used, a much higher degree is required, and the danger of cracking the lenses is increased. It is an ordinary occurrence to lose lenses in this work, or, for that matter, at any point of the process. Great care must here be observed to prevent the cement from turning yellow, and thus disturbing the transparency of the lens, and thereby cause loss of light. The lenses are next temporarily fixed in the mounting, and are ready to be examined in the camera.

Now comes the moment of suspense. Focusing on an object, and for this purpose I consider a large flat screen covered with printed matter containing various sizes of letters, or a large map hung against a perpendicular wall, the best, the first thing which comes to our notice is the focal length of the objective. It may be one-half of that which was figured upon, or twice as large and long. However, if not correct, we make note of how much it varies and proceed to examine the image. This may be sharp and brilliant in the centre and gradually become more indistinct as it nears the edge, and may remain indistinct near the edges under any amount of focusing, or it may have the same fading out of the image towards the edge, when the central portion is sharp, but this may be brought out clear by change of focus; or the image may be such that it cannot be sharply focused at any point. There is yet one possibility, but a strong improbability, that the image may be quite sharply defined over the entire screen; this, of course, is the most favorable condition. After making note of whatever the appearance may be, we proceed to determine the coincidence of visual and chemical foci. As is well known, there are, photographically speaking, two sets of light rays emitted by every object: those which form the image on the

screen, and which are most perceptible, or the visual ones, are made up by the red, yellow and orange colors of the spectrum, whereas those which make the photographed image of the chemical rays, are formed by blue, green and indigo, which are the least discernible, and it is a problem of some difficulty to bring both sets to form an image in one plane. To determine this, we proceed to make an exposure on a plate. Before doing this, however, we must be assured of these three things: first, that the ground glass is flat; second, that the plate which we intend to use is flat; third, that the plate when exposed will be in exactly the same plane as the ground glass. I lay great stress upon these points, because on them depends a reliable result, and then, because with many plates and cameras these conditions are not fulfilled. If you will go through a package of plates, you will find some almost perfectly flat, others convex, others concave, the deviation being fully as much as 1–16 inch, and, I suppose, in larger plates even more.

I do not mention this in the way of finding fault with the plate manufacturers, because ordinarily, and particularly when stops are used, it is of little moment, and because it would be almost impossible to furnish selected flat plates at the present prices. The Eastman Roll Holders I have found well adapted, because the film passes over a fixed and flat back which remains constant in its relation to the ground glass. If the ground glass is flat, then flat plates should be selected, and if the ground glass be concave, then plates corresponding to it should be used. I believe that, as a rule, where care is observed, slightly concave ground glass in plates is used because it comes in this way, and this form favors the lenses. The one thing, however, which should be insisted upon, and which, I am sorry to say, is not always the case, is that the film side of the plate should be exactly in the plane of the ground glass when it replaces it.

To determine this, the following plan, which I think is used by manufacturers of cameras, is effective.

Take a straight-edge and allow it to rest upon the face of the frame of the ground glass which rests against the back of the camera. Cut a small wedge of wood, and insert this between the straight edge and ground glass as far as it will go, and mark the edge in line with the straight edge, when it fills up the space. Now take a plate which is suited to the plate holder, and which is known to be flat, and place it in this, and by the use of the straight edge and wedge, proceed as above with the ground glass. It is unnecessary to say that the marks should agree exactly, and if not, should be made to do so.

EDWARD BAUSCH.

(*To be continued.*)

THE AWARDS OF PRIZES AT MINNEAPOLIS.

CLASS A—1st. O. P. Scott, Chicago; 2d. J. E. Rosch, St. Louis; 3d. James Landy, Cincinnati.

CLASS B—1st. S. L. Stein, Milwaukee; 2d. J. M. Appleton, Dayton; 3d. H. McMichael, Buffalo.

CLASS C—1st. J. M. Appleton; 2d. S. L. Stein; 3d. J. E. Hale.

CLASS D—1st. J. M. Appleton; 2d. J. E. Hale.

BRONZE MEDALS—Stuber Brothers, A. L. Bowersox, L. C. Overpeek, George Wise, D. Rad. Coover, W. J. Dole, Lorrin E. Miller, S. M. Adams, Anthon Rhode.

CLASS E—1st. W. H. Jackson, Denver; 2d. N. F. Curtis, Niagara Falls; 3d. G. E. Mellen, Colorado Springs.

CLASS F—1st. J. H. Smith; 2d. H. G. Peabody, Boston.

CLASS G—1st. G. F. Barker, Niagara Falls; 2d. J. A. Brush, Minneapolis.

CLASS H—1st. Theodore Heinig, Dayton; 2d. T. W. Ingersol, St. Paul.

CLASS I—1st. H. G. Peabody; 2d. Stuber Brothers.

CLASS L—1st. The Eastman Dry-plate and Film Company; 2d. J. M. Jordan, New York; 3d. C. F. O'Keefe, Fort Madison.

HIAWATHA—James Landy.

FOREIGN EXHIBITS—Gold Medal. A. Marn, Frankfurt; Silver Medal. Albert Meyer, Berlin.

B. S. HAYS, COOK ELY, GEORGE G. ROCKWOOD, *Judges.*

Mr. George Eastman received an award of special merit as the originator of an important industry bearing upon our art, and for his various practical and useful inventions. Messrs. Monfort & Hill received a special diploma for their artistic interpretation of "Hiawatha." Diplomas of excellence were also given to the following exhibitors:

THE ANTHONY PRIZES were awarded as follows: $50 for plain enlargements, to J. M. Jordan; $50 for crayon worked enlargements, to George Heyn; $25 for water-colored enlargements, to L. Walkup.

A. P. SCOTT, J. LANDY, *Judges.*

THE AIR BRUSH PRIZES were awarded as follows: For best water-colors, to A. R. Cottrell, Minneapolis. For best black and white, to N. J. Kelly, Racine, Wis.

H. MCMICHAEL, MR. DOERR, E. LONG, *Judges.*

THE ACME BURNISHER PRIZE went to President-elect McMichael for best collection of photographs.

THE MCCOLLIN BLITZ-PULVER PRIZE went to L. C. Overpeek, of Hamilton, O.

THE EASTMAN PRIZES were awarded as follows: Gold badge to Theodore Heinig, Dayton, O. Silver cup to C. F. O'Keefe, Fort Madison, Iowa. Medal to E. M. Jennings, Philadelphia.

G. CRAMER'S $100 cash prize was won by Coupon No. 370, held by Mr. Holden, of Luverne, Minn.

A special diploma was given to Milton J. Hemperly, of Philadelphia, for instantaneous pictures taken with Blitz-pulver.

MILTON J. HEMPERLY received a special diploma at the Minneapolis Convention for his series of excellent pictures taken at night with McCollin & Co.'s Blitz-Pulver. Mr. Hemperly's work not only shows great technical skill in the management of the light in producing soft and luminous shadows and pleasing touches of high light, but also bears evidence of his ability as an artist in grouping and posing his sitters. There is a degree of life-likeness in these photographs which gives them an extra charm.

Mr. Hemperly is chief operator for the well-known firm of Gilbert & Bacon, of Philadelphia, which, by the way, have concentrated their business, hitherto conducted at 40 N. Eighth St. and 820 Arch, at the latter location. They have introduced many improvements, and are in an excellent position for furnishing the high class of work for which they have been so long celebrated.

PRESENTATION TO TREASURER CARLISLE.—"A very pleasant 'wind-up' to the convention occurred at the West Hotel on Saturday evening. A party numbering about forty assembled in one of the spacious parlors of the hotel. Among those present we noticed President Decker and wife, Mr. and Mrs. W. H. Clark, Mr. and Mrs. Thompson, Secretary Potter, P. W. Guerin, R. S. Bellsmith, George Ayers, J. C. Somerville, J. Edgeworth, Seth C. Jones, Ben. Pillgrift, Cook Ely, E. H. Stoddard W. A. French, C. W. Motes, and others. As Mr. Carlisle came from the dining room he was quietly escorted into the parlor by Messrs. Potter & Clark.

"Mr. Bellsmith, in a very appropriate address on behalf of the many friends of the Treasurer, presented Mr. Carlisle with a handsome and valuable gold-headed cane, and a purse containing $50.00 in gold. The head of the cane being engraved, 'Presented to G. H. Carlisle by friends in the P. A. of A. of 1888.'

"As Mr. Bellsmith handed the cane and purse to Mr. Carlisle, it was accompanied with an outburst of applause.

"Mr. Carlisle, although completely surprised, and visibly affected, accepted the gifts, and in a remarkably strong speech thanked the donors for the expression of their appreciation and good will. Among other things, Mr. Carlisle said he hoped to see the time when the P. A. of A. would have a permanent and settled home and own their own building. This idea seemed to meet with approval of those present, as it was heartily applauded.

"Short addresses followed by President Decker, Secretary Potter, Messrs. Motes, Guerin, Clark and Geo. Ayers."

WE have received from Edward B. Harden several photographs of collieries taken with Blitz-Pulver on Cramer plates and with Darlot No. 2 lens.

They represent the interior of a coal mine in a striking manner, and show admirably the structure of the coal and the arrangement of the shafts, etc.

Several successive charges were ignited at different points, so as to light up the remote portions of the mine.

In one of the pictures is represented a miner; the expression of the face is brought out finely. The collieries are the Kohinoor and Shenandoah, Pa., and the photographs were taken at the same time as those by W. H. Rau and E. F. C. Davis noticed in our last number.

WE received from Mr. T. H. Howe a very pleasant invitation to attend the first public exhibition of photographs by the members of the Columbus Camera Club (July 12).

The card designed by Mr. J. Bradford, a member of the club, is very unique and pleasing, and furnishes a novel method of invitation. Photographs, representing views of Columbus and the building in which the exhibition was held, are tastefully grouped about the card which contains the announcement.

ANOTHER photograph of the interior of a silver mine in Arizona, taken with McCollin & Co.'s Blitz-Pulver, comes to us from E. S. Campbell.

Although 1300 feet under ground the detail of the rock is brought out with remarkable clearness.

The magnesium flash is opening a new field in subterranean photography, which may prove of value to both science and industry.

TO THE PROFESSIONAL PHOTOGRAPHERS OF AMERICA.—In response to a wish expressed by professional photographers and others, the Committee of the Vienna Club of Amateur Photographers have now decided to arrange, in their exhibition of photographs and photographic apparatus and appliances, a special department for professionals' photographs. We, therefore, herewith invite you to take part in the exhibition, and hope to see many pictures by American professionals, especially landscape and marine subjects. These photographs will enjoy all the advantages offered to the work of amateurs, viz.: No charge of any kind will be made; transportation, both ways, will be arranged for, free, by L. W. Morris & Son, of New York.

Frames for pictures will be provided by the Club.

The time for applying for space has been prolonged till August 10th.

We are, gentlemen, yours faithfully,

CHARLES SRNA,
President.

DR. JULIUS HOFMANN,
Hon. Sec.

EXECUTIVE COMMITTEE OF THE EXHIBITION BY THE PHOTOGRAPHIC CLUB IN VIENNA.

VIENNA, *July 27th, 1888.*

SIR.—We give due notice to exhibitors that the Jury of our Exhibition is composed of the following mentioned gentlemen:

W. Burger, Professor Dr. Eder, Alfred Baron de Liebig,
Aug. Chevalier de Loehr, Prof. Fritz Luckhart, Dr. Frederico Mallmann,
Charles Srna, O. Volkmer.

Yours truly,

CHARLES SRNA, *President.*

THE INTERNATIONAL ANNUAL OF ANTHONY'S PHOTOGRAPHIC BULLETIN comes to us with a refreshing harvest of rich things, at a season when there is a dearth in photographic literature. The editors have either been indefatigable in their zeal to collect the best products, or else the response to their call has been most generous. In either case the reader is the gainer, for this annual is literally surcharged with interesting and valuable papers on a great variety of subjects connected with the art and science of photography. We notice the familiar names of many who have labored earnestly to advance the cause of photography, besides many new signatures to papers the contents of which give lively promise of an enlistment of active workers to our ranks. Amongst the many pleasant things in the *International Annual*, we must not forget the graceful introduction by the editors.

THOSE who desire to avail themselves of the excellent course of instruction in photography, given at the Chautauqua University, under the direction of Prof. Chas. Ehrmann, should secure the "Photographic Instructor," published by the Scovill Manufacturing Co., N. Y. It is a compendium of the series of lessons given to the students, revised by W. I. Lincoln Adams, editor of the *Photographic Times*, and enlarged by contributions from the pens of Prof. Spaulding, Karl Klauser, O. G. Mason, Dr. Maurice Miller, and others. The instructions in the various operations necessary for making good work are expressed in clear language, so as to be easily understood even by a beginner, yet without redundancy or unnecessary minutiæ.

OF photographic literature coming to us from America we cannot speak too highly, and must compliment Mr. John Bartlett upon his able editorship of the *American Journal of Photography*. The July number contains some very valuable contributions, and a capital silver print from a negative exposed at night by the aid of Messrs. McCollin and Co.'s "Blitz Powder."—*The London Amateur Photographer*.

NOW-A-DAYS the exacting amateurs demand something more in a trade catalogue than a mere account of commodities. Mr. T. H. Blair, of the Blair Camera Co., Boston, has sought to meet the demand by interspersing the advertisement sheets with a good deal of information which will aid the beginner in securing good results. The little pamphlet is free to every applicant.

AUGUST BARGAIN LIST.

Accessories:

1—Iron Centre Camera Stand, .	2 50
1—8-inch Burnisher, ...	6 00
1—20-in Entrekin Eureka Burnisher	30 00
1—Seavey Swiss Cottage Accessory	12 00
1—8x8 Interior Background, . .	6 00
1—8x10 Hough's Exterior Ground, new, light left, ...	11 00
1—8x10 Exterior Ground, good condition, ...	10 00
2—Spencer Head-rests	11 00
British Journal Almanacs for 1878	20
Photo Mosaics for 1883, ...	20
1—8x10 Plain painted ground .	3 00
1—Knickerbocker stand, with 14x17 top	9 00
1—8x10 Osborne's interior background, new, light left . . .	20 00
1—4x8 Osborne's side slip . . .	7 50
1—Osborne stile, new	4 50
Interchangeable View Albums, 7x10, for 5x8 views, with removable leaves fastened by cord, each	1 35
Pearl leads, the best retouching point in the market, each .	15
Job lot fine cab. Plush Frames, each	60
8x10 Job Lot Picture frames; write for particulars.	

Desiring to reduce our stock, we will sell for a short time.

	PER DOZ.
5x7 Woodbury Dry Plates . . .	77
4¼x6½ " " . . .	65
6½x8½ Triumph " . . .	85
5x7 " " . . .	55
4¼x6½ " " . . .	45
5x8 Neidhardt " . . .	65
4x5 Bridle " . . .	35

Camera Boxes:

1—Bicycle Camera, lens, holder and case, good as new . . .	7 00
1—11x14 D. S. Portrait Camera and holder	20 00
1—11x14 Scovill View Camera with double dry plate holder,	35 00
1—8x10 American Optical Co.'s Royal Camera, double swing and carriage movement, .	25 00
1—8x10 Ferrotype Box, Carriage movement and glass cornered holder and 4x4 lens	30 00

1—5x7 Flammang revolving back camera, three holders, extension tripod, Darlot wide angle lens and canvas case . . . 50 00
1—4x5 Photo-Microscopic enlarging outfit, ... 14 00
1—5x8 Tourist Outfit, including 5x8 Tourist Camera Box, 2 Daisy Plate Holders, 1 Extension Tripod, and 1 Canvas Carrying Case, very little used. Price, new, $40.50, will sell for 30 00
1—10x12 Cone View Camera, Double Swing, new 52 80
1—14x17 New Haven Acme Portrait Camera, Single Swing, new 46 00
1—4x4 Standard Portrait Camera wet holder, new 14 75
1—4x5 Flammang revolving back Camera, new, ... 25 00
1—4¼x5½ No. 202 A. Scovill Outfit 20 50
1—6½x8½ View Camera and Lens 12 00
1—5x8 Wet Plate Stereo Camera, 3 holders, case and tripod . 25 00
1—6½x8½ American Optical Co. first qual. View Camera . . 23 00
1—4¼x5½ Ex. qual. Portrait Camera 17 50
1—5x8 American Optical Co. Stereo Camera 25 00
1—6½x8½ Standard Portrait Camera, web holder 13 60
1—5x8 Blair View Camera, single swing 17 00

Lenses:

1—4x5 Dallmeyer ($56) Portrait Lens, nearly new 20 00
1—7x7 Rectilinear View Lens . 10 00
1—14x17 Roettger Portrait Lens 35 00
1—Set ⅛ size Tubes 15 00
1—No. 3 Euroscope Lens . . . 50 00
1—½ size Darlot Portrait lens, . 5 00
1—½ size Harrison Portrait lens, cut for stops 10 00
1—4x4 Harrison Portrait Lens, cut for stops 20 00
1—½ size Voigtlander Lens . . 15 00
1—Matched pair German Stereoscopic Lenses, in good order . 15 00
1—4x5 Dallmeyer View Lens . . 15 00
1—Woodward Condensing Lens 10 00
1—4x4 Darlot Globe Lens . . . 25 00
1—4x4 " " " . . . 20 00
1—⅓ size L. W. Krantz Portrait Lens 12 50
1—½ size C. C. Harrison portrait lens 8 00
1—½ size Darlot quick acting Portrait Lens, central stops . 18 00
1—No. 6, 17x20 Darlot wide-angle Hemispherical Lens 38 00
1—Extra 4x4 Chapman Portrait Lens 20 00
1—8x10 E. A. View Lens . . . 5 00
1—Ross View Lens 5 00
1—H. Fitz Double View Lens, revolving stops 8 00
1—8x10 Voigtlander PortraitLens 80 50
1—4x4 Dallmeyer Group Lens . 50 00
1—4x4 Walzl Portrait Lens . . 20 00
1—⅛ Beck Microscopic Objective, nearly new, ... 20 00
1—¼ size portrait lens 3 00

FOR SALE—Photograph Gallery. Centrally located in city of 70,000 inhabitants. Doing a good, paying business. Owner compelled to sell on account of ill health. For particulars address T. H. McCOLLIN & Co.,
635 Arch St., Phila.

WANTED—Permanent situation as retoucher—a first-class hand.
E. URBAN, 430 N. 4th St., Phila.

WANTED.—First-class live Printer. Joseph G. Morris, 16 Sixth Street, Pittsburgh.

TO meet the frequent inquiries for a cheap *rectilinear* lens, we have put on the market the "Orthoscope." These are light, compact and quick acting, so that they can be used for instantaneous work. Sizes, 4x5, $10.00; 5x8, $15.00.
THOS. H. McCOLLIN & Co.,
635 Arch Street, Phila.

ROLFE'S Retouching Compound, the best preparation for preparing negatives for the work of retouching. Price, 40 cents per bottle. For sale by
THOS. H. McCOLLIN & Co.,
635 Arch Street,
Philadelphia.

FOR SALE—Photograph Gallery near Philadelphia, established for one year, or will take partner with some capital to push business. Address P., care of Thos. H. McCollin & Co., 635 Arch St., Phila.

WANTED—A Retoucher. Address, JOHN D. STRUNK, 730 Penn St., Reading, Pa.

FOR SALE—In perfect condition (having been used only a few times) a No. 2 A Dallmeyer lens. This lens is used by all the best photographers for rapid portrait work, having a flat field, great depth of focus and wide opening. List price, $148.00; will be sold for spot cash, $90.00.

THOS. H. MCCOLLIN & CO.,
635 Arch St., Philadelphia.

CRUSHED Hyposulphite of Soda in neat pasteboard boxes—8 cents per pound.

FOR SALE — A gallery in Atlantic City; first-class condition, conveniently arranged, good location. Also, tent (new) and outfit. Address, S. H. COPE, Box 409. Norristown, Pa.

WANTED—A Manager in our Photograph Department. Applicant must thoroughly understand the commercial department of photographics, know sources of supply, understand the requirements of the trade, and have had thorough experience in such work. Address, by letter only,

J. W. QUEEN & CO.,
924 Chestnut Street, Philadelphia.

Important Announcement

TO ALL PARTIES USING PHOTOGRAPHIC PLAIN SALTED PAPERS.

That hereafter I shall prepare both Matt and Leatherized Salted Papers by an entirely new process, for keeping its primary color for several days after its being sensitized (it being excluded from light and sulphur fumes in the meantime, and the way to do this is to be placed in tin tubes made near air-tight). Among its many qualities are Toughness, a superior matt surface, having a splendid tooth for all kinds of artists' work.

Float on any ordinary silver bath, and fume from 20 to 30 minutes, or swab with ammonia nitrate of silver, made thus: to 480 grains of silver add 12 ounces of water; when dissolved, pour off one-third, to the remaining two-thirds add strong ammonia, which forms a precipitate, and still add until all the precipitate is re-dissolved, then add the remaining one-third to this, add sufficient C. P. nitric acid, drop by drop, until the residue is nearly taken up; this needs no fuming, and when dry it is ready for use, and, in my judgment, makes the best prints. If bath discolors, add a few drops of table salt solution, and sun well.

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"	5½ x 8½.	"	5 x 8.			1⅝	"	1.05
"	7 x 9.	"	6½ x 8½			1¾	"	1.15
"	8½ x 10½.	"	8 x 10.			1⅞	"	1.65
"	11 x 13.	"	10 x 12.			2	"	2·75
"	12 x 15.	"	11 x 14.			2⅛	"	3.75
"	15 x 18.	"	14 x 17.			2⅛	"	5.25
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"	5½ x 8⅛.	"	4¼ x 6½, 5 x 7, and 5 x 8.	¾	"		0.56
"	7 x 9.	"	6½ x 8⅛.	1	"		0.72
"	8½ x 10⅛.	"	8 x 10.	1⅛	"		1.08
"	11 x 13.	"	10 x 12.	1¼	"		1.56

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This Journal will endeavor to set forth the capabilities of the direct reproductive processes – those presenting their subjects without intervention. Without parade, it will submit their results, and leave them to argue their own cause.

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In these busy latter days, the story of the world must be largely told by pictures. They speak the only universal language. From the specialist's point of view not only the process engraver, but the photographer, amateur and professional, the painter, illustrator, and draughtsman as well, will find material to help him.

On all such we call for contributions. Above all, we ask photographers to send us negatives of interest from their art or their subject; current events; good detective and instantaneous bits; plates remarkable in any way; and with that excellent spirit they have always shown, to help us make "SUN AND SHADE" a bright, efficient, interesting record of events by photographic processes.

Contributions should be addressed to

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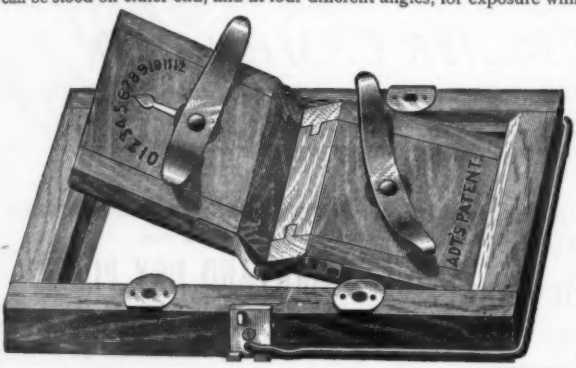

One great advantage of this support, in addition to its convenience in supporting the frame, arises from the fact that it is out of the way of the printer when introducing the paper, or examining the print, for when the frame lies or is held with back up, the support instantly drops upon its stops for rest, and is entirely out of the way of the hand of the printer, so that he may remove or open the back-board, or replace it, as if there were no support present.

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They are larger in diameter than Lenses by other makers of equal focus, covering the same sized plate. This gives room for more perfect correction of the spherical aberration than is possible with Lenses of smaller diameter and at the same time allows the admission of an additional number of light rays, consequently greatly increasing their value as Portrait and Instantaneous Objectives.

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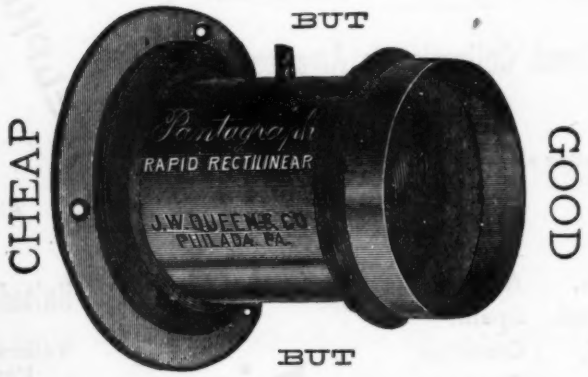

The Pantagraph Rectilinear Lenses possess many valuable properties peculiar to themselves. They are perfectly rectilinear, and work well with the largest diaphrams for groups and instantaneous views. Their great compactness and lightness are a boom to the out-door artist, while their flatness of field and their penetrating power, in which, from carefully made tests, they are equal to many of the noted lenses in the market, render them very valuable for landscapes and copying work of every discription.

For those to whom the price of our Francaise Lenses would be an obstacle, The Pantagraph Lenses will be found especially satisfactory.

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Catalogue No.	Size of Plate.	Diameter of Lens.	Back Focus.	Equivalent Focus.	Extreme Angle	Price.
P-41.	3¼x4¼ ins.	⅝ ins.	4 ins.	4⅞ ins.	80°	$ 10 00
P-42.	4 x5 ins.	1 1-16 ins.	5 ins.	5¾ ins.	78°	12 00
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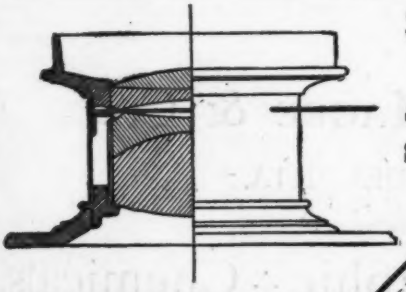

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